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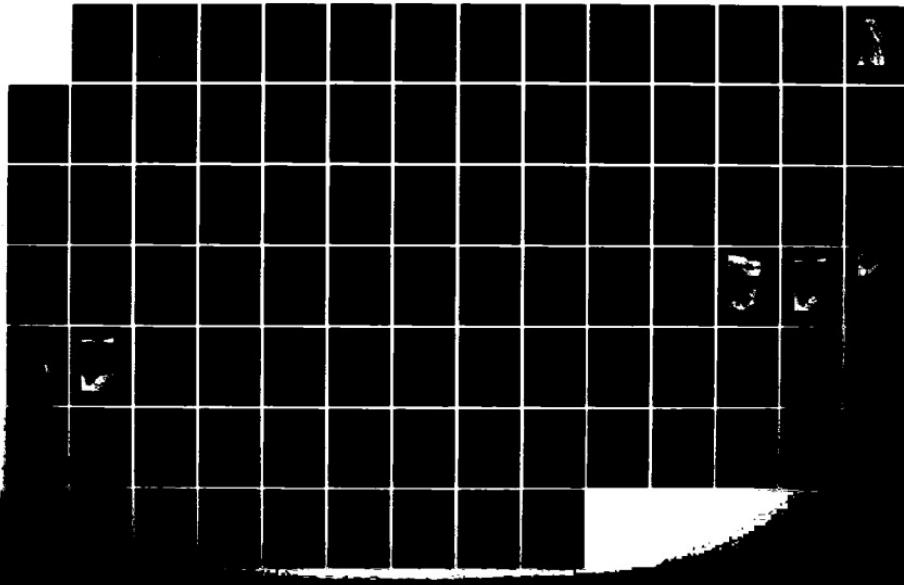
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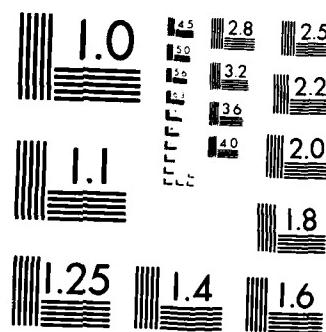
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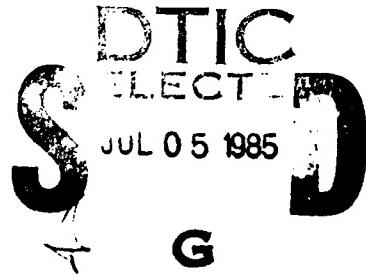
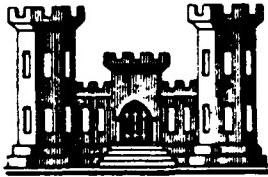
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ORANGE RIVER BASIN  
WHITING, MAINE

ROCKY LAKE DAMS  
ME - OO399

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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S-110



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS. 02154

MARCH 1979

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER  ME 00399	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  Rocky Lake Dams		5. TYPE OF REPORT & PERIOD COVERED  INSPECTION REPORT
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)  U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS  DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE  March 1979
		13. NUMBER OF PAGES  58
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		15. SECURITY CLASS. (of this report)  UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)  APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES  Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  DAMS, INSPECTION, DAM SAFETY, Orange River Basin Whiting Maine Rocky Lake		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  The dams consist of two stone filled timber crib structures located about 400 ft. apart. The dams are assessed to be in poor condition. Because the south-easterly dam has been breached, it poses no threat to life or property downstream. It is intermediate in size with a hazard potential of low.		



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02154

REPLY TO  
ATTENTION OF:  
NEDED

MAY 29 1979

Honorable Joseph E. Brennan  
Governor of the State of Maine  
State Capitol  
Augusta, Maine 04330

Dear Governor Brennan:

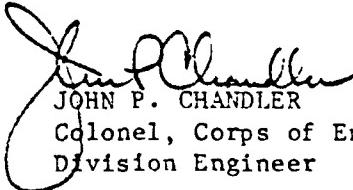
I am forwarding to you a copy of the Rocky Lake Dams Phase I Inspection Repcrt, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Agriculture and the Department of Transportation, cooperating agencies for the State of Maine. In addition, a copy of the report has also been furnished the owner, M.J. Garber and Herman Galvin, c/o Mr. Warren Strout, MacDonald Page Co., 562 Congress Street, Portland, Maine 04112.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you, the Department of Agriculture and the Department of Transportation for your cooperation in carrying out this program.

Sincerely yours,

  
JOHN P. CHANDLER  
Colonel, Corps of Engineers  
Division Engineer

Incl  
As stated

ORANGE RIVER BASIN  
WHITING, MAINE

ROCKY LAKE DAMS  
ME-00399

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

ME-00399

ROCKY LAKE DAMS

WASHINGTON COUNTY, MAINE

ROCKY LAKE

November 28, 1978

BRIEF ASSESSMENT

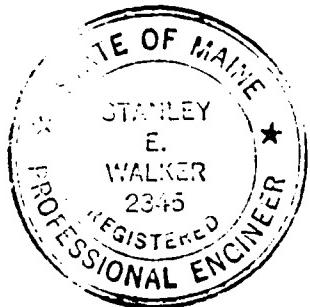
The Rocky Lake Dams consists of two stone-filled timber crib structures located about 400 feet apart, separated by an island. The northerly dam is in seriously dilapidated condition and the southerly dam has been breached and retains no water. The northerly dam is about 14 feet high, and is about 150 feet long.

Based on the visual inspection, the Rocky Lake Dams are assessed to be in poor condition. Because the southerly dam has been breached, it poses no threat to life or property downstream. Although the northerly dam is in poor condition, the structure appears to present little threat to the safety of downstream residents or property. Based on the Corps of Engineers guidelines, the dams are classified as intermediate size dams having a low hazard potential.

The spillway test flood is one-half the probable maximum flood (PMF). The test flood outflow is about 1450 cfs. The spillway capacity of the northerly dam plus capacity of the culvert under the road, located about 100 feet downstream of the breached southerly dam, is about 59 percent of the routed test flood.

Due to the dilapidated condition of both dams, it appears that an attempt to repair the structures would be impractical. Complete reconstruction would be required to upgrade the condition of the structures. Within 12 months of receipt of this report, the Owner should engage a qualified engineer to advise him whether to remove or reconstruct the

dams. Reconstruction or removal should be done under the supervision of a qualified engineer. If the dams are to be reconstructed, a program of annual periodic technical inspection should be instituted.



EDWARD C. JORDAN CO., INC.

Stanley E. Walker, P.E.  
Project Officer

This Phase I Inspection Report on Rocky Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

*Joseph W. Finegan*  
JOSEPH W. FINEGAN, JR., MEMBER  
Water Control Branch  
Engineering Division

*Corney M. Terzian*  
CARNEY M. TERZIAN, MEMBER  
Design Branch  
Engineering Division

*Joseph A. McElroy*  
JOSEPH A. MCELROY, CHAIRMAN  
Chief, NED Materials Testing Lab.  
Foundations & Materials Branch  
Engineering Division

APPROVAL RECOMMENDED:

*Sue B. Fryar*  
SUE B. FRYAR  
Chief, Engineering Division

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonable possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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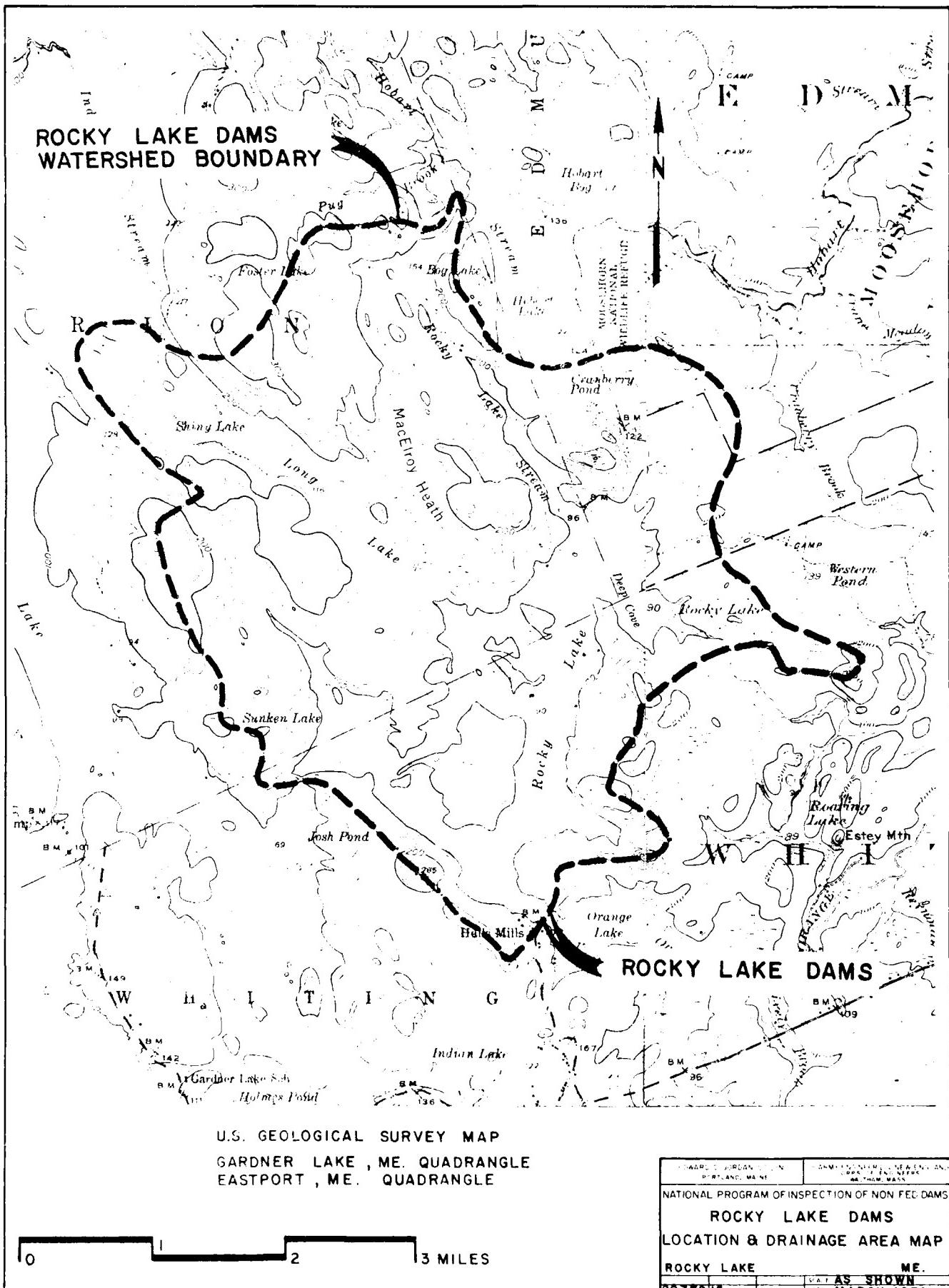
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OVERVIEW



EDWARD C. AGRICOLA, JR.	COMMISSIONER OF THE BUREAU OF LAND MANAGEMENT PORTLAND, MAINE
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS	
<b>ROCKY LAKE DAMS</b>	
<b>LOCATION &amp; DRAINAGE AREA MAP</b>	
ROCKY LAKE ME.	
2079915	VIA AS SHOWN DATE MARCH 1979

PHASE I INSPECTION REPORT

ROCKY LAKE DAMS

SECTION 1

PROJECT INFORMATION

1.1 GENERAL

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Edward C. Jordan Co., Inc. has been retained by the New England Division to inspect and report on selected dams in the states of Maine and New Hampshire. Authorization and notice to proceed were issued to Edward C. Jordan Co., Inc. under a letter of December 1, 1978 from Max B. Scheider, Colonel, Corps of Engineers. Contract No. DACW33-79-C-0017 has been assigned by the Corps of Engineers for this work.

b. Purpose

- (1) To perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
- (2) To encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.
- (3) To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF PROJECT

a. Location. The Rocky Lake Dams are located at the outlet of Rocky Lake in the town of Whiting, Maine. N 44°-46.1', W 67°-16.0'.

- b. Description of Dam and Appurtenances. The Rocky Lake Dams consist of two stone-filled timber crib structures located about 400 feet apart and separated by an island. The northerly dam is in seriously deteriorated condition and the southerly dam has been breached and retains no water. The northerly dam is about 14 feet high and is about 150 feet long.
- Plan and profile and cross-sections are presented in Appendix B.
- c. Size Classification. The Rocky Lake Dams have a storage capacity of about 9000 acre-feet and a height of 14 feet. According to Corp of Engineer's "Recommended Guidelines for Safety Inspection of Dams," a dam with storage capacity greater than 1,000 acre-feet but less than 50,000 acre-feet or a height greater than 40 feet but less than 100 feet is classified as an intermediate size dam.
- d. Hazard Classification. The Rocky Lake Dams are classified as having a low hazard potential. The peak flow from the hypothetical failure of the dams was estimated to be about 6900 cfs based on guideline procedures provided by the Corps of Engineers. Failure of the dams would result in water surface elevations about 6.5 feet higher than normal at the outlet of Orange Lake and about 7 feet higher than normal at the first downstream bridge, about 2.2 miles below the dam. Downstream of this bridge the water surface elevation would essentially be retained within swampy areas located in the flood plain.

e. Ownership.

Current Co-Owners: M.J. Garber & Herman Galvin  
Contact: M.J. Garber  
c/o Warren Strout  
MacDonald Page Co.  
562 Congress Street  
Portland, Maine 04112  
Tel. 207-774-5701

Previous Owner: Unknown

f. Operator.

None. (See e. above for contact person.)

g. Purpose of Dam. This dam is presently used to control the water level at Rocky Lake Dam for recreational purposes.

h. Design and Construction History. There is no available design and construction data pertinent to the dams.

i. Normal Operating Procedure. No operating and maintenance program is followed.

1.3 PERTINENT DATA

a. Drainage Areas. The drainage area consists of approximately 16.8 square miles of gently sloping forested terrain. Rocky Lake has an area of 1.8 square miles (1150 acres), which represents about 11 percent of the drainage area.

b. Discharge at Damsite. No record of high water could be located. The impounding system consists of a northerly and a southerly dam separated by an island. The southerly dam has been breached and hydraulic control for flood waters is at the road culvert, about 100 feet downstream of the dam.

(1) Outlet Works - The outlet works at the northerly dam are inoperable. At the southerly dam (roadway hydraulic control), there is a culvert that measures 8.8 feet wide by 11.8 feet high with an invert elevation of 79 MSL, about 7.5 feet below the lake outlet. The capacity of the culvert flowing full is about 460 cfs.

- (2) The maximum flood at the damssite is unknown.
- (3) Ungated spillway capacity with the pond at the top of the northerly dam is 400 cfs. There is no spillway at the southerly dam.
- (4) Gated spillway capacity is not applicable.

(5) Total project discharge at test flood (1/2 PMF) elevation of 93 is 1450 cfs.

c. Elevation. The survey datum was adjusted to mean sea level (MSL) datum based on the assumption that spillway crest of the northerly dam is equal to normal water surface elevation of 90 (MSL), as shown on the Gardner Lake, Maine U.S. Geologic Survey quadrangle. Due to the breaching of the southerly dam, present normal water surface is assumed to be elevation 88 (MSL).

The following elevations above mean sea level are approximate only.

Item	Elevation (Feet Above MSL)
Top of northerly dam	92.0
Top of roadway downstream of southerly dam	93.7
Test flood (1/2 PMF) pool	93.0
North dam spillway crest	90.0
Full flood control pool	N/A
Recreation pool	88
Invert culvert located downstream of southerly dam	78.9
Streambed at centerline of northerly dam	78
Maximum tailwater	Unknown

d. Reservoir.

Item	Length (Miles)
Maximum pool	3.8
Recreation pool	3.5
Flood control pool	N/A

e. Storage.

Item	Storage (Acre-Feet)
Recreation pool (elev. 88)	4200
Northerly dam spillway crest (elev. 90)	6510
Top of dam (elev. 92)	9320
Test flood (1/2 PMF) (elev. 93.0)	10430

f. Reservoir Surface.

Item	Surface Area (Acres)
Recreation pool	1100
Flood control pool	N/A
Spillway crest pool	1150
Test flood (1/2 PMF) pool	1465
Top of dam	1360

g. Dam.

Type - the dams are stone-filled timber crib structures abutted by earth embankments.

Length - The southerly dam has been breached; it was about 160 ft long. The length of the northerly dam is about 150 feet.

Height - The northerly dam is about 14 feet high.

Top Width - See plan and profile and cross-sections in Appendix B.

Side Slopes - See sketches in Appendix B.

Zoning - None.

Impervious Core - None.

Cutoff - Timber planking and mud seal.

Grout Curtain - None.

h. Diversion and Regulating Tunnel. Not applicable.

i. Spillway.

Type - The northerly dam has two self-loading timber deck spillways. See sketches in Appendix B.

Length - 39+ and 14+ feet.

Crest Elevation (Northerly Dam) - 90 (MSL).

Gates - None.

Downstream Channel - The channels below the northerly and southerly dams are narrow with a slope of about 0.7 percent. See Photographs 5 and 7. Both streambeds are composed primarily of gravel and cobbles. Located about 100 feet downstream of the southerly dam is an 8.8-foot wide by 11.8-foot high culvert beneath a road. This culvert appears to restrict the channel and is likely the hydraulic control during flood flow. The north channel is littered with debris, including two fallen trees. The two channels join as they enter Orange Lake about 1500 feet downstream of the dams.

j. Regulating Outlets.

Invert - Southerly dam - none  
Northerly dam - 83 (MSL)

Size - Southerly dam - none  
Northerly dam - two bays 5 ft wide by 9 ft high

Description - Control of the northerly dam outlet was by stop logs located between timber supports. Due to the deteriorated condition of the timber in the dam and the damming performed by beavers, the stop log outlet is not operable.

Control Mechanism - None

SECTION 2  
ENGINEERING DATA

2.1 DESIGN

No design data were available for the Rocky Lake Dams.

2.2 CONSTRUCTION

No engineering data were available regarding construction of the dams.

2.3 OPERATION

No engineering operational data were available.

2.4 EVALUATION

a. Availability. There are no engineering data or plans available that would be useful in evaluating the integrity of the Rocky Lake Dams.

b. Adequacy. The lack of engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, performance history and engineering judgment.

c. Validity. Not applicable.

SECTION 3  
VISUAL INSPECTION

3.1 FINDINGS

- a. General. The Rocky Lake Dams consists of two structures which close the outlets from Rocky Lake. The structures are about 400 feet apart, separated by an island. The southerly dam has been breached and the northerly dam is in a dilapidated condition.
- b. Dams. The northerly dam is a stone-filled, timber cribwork structure. It is about 150 feet long and about 14 feet high. It is badly dilapidated as can be seen in Photograph 6. The timber members are rotted, split and broken, and many have become dislodged. The dam was retaining about 10 feet of water on November 28, 1978. Leakage through the structure was estimated to be 200 gpm. The stop log outlet works at the dam are dilapidated and inoperable and one outlet is presently closed by beaver workings.

The southerly dam was also a timber cribwork structure. It has been breached and presently retains no water. The timber structure is extremely dilapidated as shown in Photograph 5.

About 150 feet upstream of the remnants of the south dam, there is an earth embankment dike which appears to have been constructed since the breaching of the timber dam. This dike is about 200 feet long, 6 feet high and appears to close the old stream channel, as shown on the general site plan in Appendix B-1. The existing channel is just north of the northerly end of the dike. This channel has a bed consisting of bedrock overlain by cobbles and boulders. The channel is somewhat restricted by boulders and cobbles placed in the channel apparently to maintain low water hydraulic control. The earth dike appears to be in good condition. Some seepage is occurring at the downstream toe.

- c. Appurtenant Structures. Not applicable.

- d. Reservoir Area. The reservoir consists of Rocky Lake which is about 1150 acres and has a forested shoreline as shown in Photograph 3. There are a few cottages on the shore of the lake. The potential for slope failure above the dam appears minimal.
- e. Downstream Channel. The channels below the northerly and southerly dams are narrow with a slope of about 0.7 percent. See Photographs 5 and 7. Both streambeds are composed primarily of gravel and cobbles. Located about 100 feet downstream of the southerly dam is an 8.8-foot wide by 11.8-foot high culvert beneath a road. This culvert appears to restrict the channel and is likely the hydraulic control during flood flow. The north channel is littered with debris, including two fallen trees. The two channels join as they enter Orange Lake about 1500 feet downstream of the dams.

### 3.2 EVALUATION

Based on the visual inspection, the Rocky Lake Dams appears to be in poor condition. The northerly timber dam is badly dilapidated but presently intact and is retaining about 10 feet of water. The southerly timber dam has been breached. At the southerly dam low flow control is provided by a dike and restricted channel located about 150 feet upstream, and flood flows are controlled by the culvert beneath the road located about 100 feet downstream of the dam. Although in poor condition, the structure appears to present little threat to the safety of downstream residents or property. Further deterioration and eventual breaching will likely occur at the northerly dam. However, due to its timber cribwork construction, the breaching will likely occur in stages as opposed to a rapid failure of the entire structure.

SECTION 4  
OPERATING PROCEDURES

4.1 PROCEDURES

There are no operating procedures.

4.2 MAINTENANCE OF DAM

There is apparently no maintenance program for the dams.

4.3 MAINTENANCE OF OPERATING FACILITIES

There is apparently no maintenance program for operating facilities.

4.4 DESCRIPTION OF ANY WARNING SYSTEM IN EFFECT

No warning system is known to be in effect.

4.5 EVALUATION

The Rocky Lake Dam operating equipment is in poor condition and is inoperable. No formal warning system for either high water or structural distress is in effect at the dams.

## SECTION 5

### HYDRAULIC/HYDROLOGIC

#### 5.1 EVALUATION OF FEATURES

- a. General. Both the north and south dams are stone-filled timber crib structures. The south dam has been breached and the roadway just downstream serves as the flood water hydraulic control at the southerly damsite. The two dams are about 400 feet apart and are separated by an island.
- b. Design Data. Design data were not available.
- c. Experience Data. No information regarding specific overtopping events or other notable hydrologic occurrences was disclosed. However, it is reported by a local resident that the southerly dam breached about 10 years ago. The timbers on the northerly dam are rotted, split and broken, and many have become dislodged. However, the dam is still intact.
- d. Visual Observations. The outlet of Rocky Lake is controlled by two dams. The northerly dam outlet section is inoperable, and flow is controlled by two spillway sections. On November 28, 1978, the water surface of Rocky Lake was about 2 feet below spillway crest. About 150 feet upstream of the remnants of the breached southerly dam, there is an earth dike which reportedly has been constructed since the breaching of the timber dam. This dike is about 200 feet long, 6 feet high and appears to close the old stream channel. The existing channel is just north of the northerly end of the dike. This channel has a bed consisting of bedrock overlain by cobbles and boulders. The channel is somewhat restricted by boulders and cobbles placed about 2 feet high in the channel, apparently to maintain low water hydraulic control.

Below the breached southerly dam is a roadway culvert that provides flood water hydraulic control.

- e. Test Flood Analysis. The Rocky Lake Dams are classified as having a low hazard potential. Based on Corps of Engineers "Recommended Guidelines for

"Safety Inspection of Dams" the spillway test flood is 1/2 of the probable maximum flood (PMF). The test flood was calculated to be about 5500 cfs, based on the COE's "Preliminary Guidance for Estimating Probable Maximum Discharges in Phase I Dam Safety Investigations." Consideration of the effect of surcharge storage reduces the test flood to 1450 cfs. The spillway capacity of the north dam plus the culvert capacity at the south damsite is about 860 cfs, which is about 59 percent of the routed 1/2 PMF. During the test flood event, the north dam would be overtopped by about 1 foot.

- f. Dam Failure Analysis. The hazard potential was determined by analyzing downstream dam failure hydrographs based on rule of thumb methods presented in an attachment to ETL 1100-2-234. The failure analysis assumes a breaching of the northerly dam with water surface at the top of the dam.

The peak flood flow including a breaching of the north dam, and flow through the culvert at the south damsite would be about 5700 cfs. Rocky Lake would empty in about 38 hours. The wave height at the north dam would be about 10 feet. At the outlet from Orange Lake, about 1.3 miles downstream, the flood peak would be attenuated to about 4200 cfs, and the normal elevation of the lake would rise about 6.5 feet. At the first downstream bridge, 2.2 miles below the dams, the flood peak would be reduced to about 3400 cfs and the flood depth would be about 7 feet. Downstream of the bridge the flood wave would essentially be maintained within swampy areas adjacent to the Orange River.

It appears that no downstream residences would be affected by failure of the dam. Potential damage appears to be limited to the cemetery on the north bank of the north discharge channel, and the bridge located about 2.2 miles downstream of the dams.

Since the timber crib structure of the north dam is badly dilapidated, resistance to overtopping is considered to be poor. Based on test flood calculations, the roadway at the south dam site would not be overtopped by the 1/2 PMF.

SECTION 6  
STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

- a. Visual Observations. Based on the visual inspections, the Rocky Lake Dams appear to be in poor condition. The northerly timber dam is badly dilapidated but presently intact. However, flood flows overtopping the spillway sections would likely cause progressive breaching of the dam. Due to its timber cribwork construction, breaching will likely occur in stages. The southerly timber dam has been breached. The flow control at the south damsite is provided by a dike and restricted channel upstream and the road and culvert downstream.
- b. Design and Construction Data. None available.
- c. Operating Records. None available.
- d. Post Construction Changes. Since original construction, both the north and south dams have undergone progressive deterioration and the south dam has been breached. Subsequent to the breaching of the south dam, an earth dike had been constructed upstream of the timber dam to restrict the channel and maintain pond level.
- e. Seismic Stability. The dam is located in Seismic Zone No. 1 and in accordance with recommended Phase I Guidelines, does not warrant seismic analysis.

## SECTION 7

### ASSESSMENT, RECOMMENDATIONS, AND REMEDIAL MEASURES

#### 7.1 DAM ASSESSMENT

- a. Condition. Based on the visual inspection and performance history of the Rocky Lake Dams, they are assessed to be in poor condition. The southerly dam has been breached. Low flow control is provided presently by an earth dike which restricts the upstream channel and, high flow control is provided by a roadway culvert in the downstream channel. The northerly dam is intact and retains about 10 feet of water. This timber structure is seriously dilapidated and flows overtopping the spillway section will likely cause progressive breaching. Due to the lack of significant downstream hazard, however, the condition presents little threat to the safety of downstream residents or property.
- b. Adequacy of Information. The information available is such that the assessment of the condition of the dam must be based primarily on the visual inspection, the past operational performance of the dam, and engineering judgment.
- c. Urgency. The recommendations and remedial measures outlined in 7.2 and 7.3 below should be implemented within 12 months after receipt of this report by the owner.
- d. Need for Additional Investigation. Additional investigation is not considered necessary for the current assessment.

#### 7.2 RECOMMENDATIONS

A qualified engineer should be engaged to advise the Owner whether to remove or reconstruct the dams. Reconstruction or removal should be done under the supervision of a qualified engineer with consideration given to potential release of accumulated sediments or other possible environmental impacts of lowering the level of Rocky Lake. Any structure built to maintain the lake in back of the breached dam, such as the present dike, should be appropriately designed by a qualified engineer.

### 7.3 REMEDIAL MEASURES

a. Operation and Maintenance Procedures. Due to their dilapidated condition, it appears that an attempt to repair the structures from their present condition would be impractical. Complete reconstruction would be required to upgrade the condition of the structures. If the dams are to be reconstructed, a program of annual periodic technical inspection should be instituted.

The remains of the south dam should be removed from the channel. Further break-up of this breached dam could clog the downstream culvert causing flooding.

### 7.4 ALTERNATIVES

The alternatives available appear to be removal of the structures or replacement (reconstruction) of the structures.

APPENDIX A

VISUAL INSPECTION CHECK LIST  
AND  
SUPPLEMENTARY INSPECTION NOTES

VISUAL INSPECTION CHECKLIST  
PARTY ORGANIZATION

PROJECT Rocky Lake Dams

DATE 11/28/78

TIME P.M.

WEATHER Snow, rain, cold

W.S. ELEV.        U.S.        DN.S.       

PARTY:

- |                           |                            |
|---------------------------|----------------------------|
| 1. <u>Stephen Cole</u>    | 6. <u>                </u> |
| 2. <u>Brian Bisson</u>    | 7. <u>                </u> |
| 3. <u>Scott Decker</u>    | 8. <u>                </u> |
| 4. <u>John Kimble</u>     | 9. <u>                </u> |
| 5. <u>Charles Goodwin</u> | 10. <u>               </u> |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>Geotechnical</u>	<u>Cole</u>	
2. <u>Structural</u>	<u>Cole, Decker</u>	
3. <u>Hydraulics/Hydrology</u>	<u>Bisson</u>	
4. <u>Civil</u>	<u>Decker</u>	
5. <u>Photography</u>	<u>Decker, Bisson</u>	
6. <u>Survey</u>	<u>Kimble, Goodwin</u>	
7. <u>                </u>		
<u>Review Inspection</u>	<u>Stanley Walker and</u>	
<u>Dec. 14, 1978</u>	<u>Charles Horstmann</u>	
<u>No significant differences observed from 11/28/78 inspection</u>		

NOTE: See Supplementary Inspection Notes Following Checklist

## INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78  
PROJECT FEATURE Embankment NAME Cole  
DISCIPLINE Geotechnical NAME \_\_\_\_\_

AREA EVALUATED	CONDITIONS
<u>DAM EMBANKMENT</u>	South dam dike* at pond, above old dam      North dam - no dike embankment
Crest Elevation	92+ (MSL)
Current Pool Elevation	88 (MSL)      NOT APPLICABLE
Maximum Impoundment to Date	Unknown
Surface Cracks	None
Pavement Condition	Turf
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Okay
Horizontal Alignment	Okay
Condition at Abutment and at Concrete Structures	N/A
Indications of Movement of Structural Items on Slopes	None
Trespassing on Slopes	None
Sloughing or Erosion of Slopes or Abutments	None
Vegetation	Turf

\*Dike does not close the stream, about 40 feet of open channel exists north of the dike. This section controls at low flow.

AREA EVALUATED	CONDITIONS	
DAM EMBANKMENT (cont.)	South Dam	North Dam
Rock Slope Protection - Riprap Failures	None	NOT APPLICABLE
Unusual Embankment or Downstream Seepage	Minor seepage near midpoint of dike.	
Piping or Boils	None	
Foundation Drainage Features	None	
Toe Drains	None	
Instrumentation System	None	

## INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78

PROJECT FEATURE Intake Channel, Structural NAME Cole, Decker

DISCIPLINE Structural, Geotechnical  
Hydraulics/Hydrology NAME Bisson

AREA EVALUATED	CONDITION	
<u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u>	South Dam	North Dam
a. Approach Channel		
Slope Conditions	Flat, stable	Flat, stable
Bottom Conditions	Gravel	Ice covered, could not be observed.
Rock Slides or Falls	None	None
Log Boom	None	None
Debris	None	Beaver workings
Condition of Concrete Lining	N/A	N/A
Drains or Weep Holes	N/A	N/A
b. Intake Structure		
Condition of Concrete	N/A	Timber, poor
Stop Logs and Slots	N/A	Timber, poor

INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78

PROJECT FEATURE Control Tower NAME Cole, Decker

DISCIPLINE Structural, Civil  
Hydraulics/Hydrology NAME Bisson

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - CONTROL TOWER</u>	<u>South Dam</u> <u>North Dam</u>
a. Masonry and Structural	
General Condition	Old timber dam downstream of earth dike has been breached.
Condition of Joints	Control tower consists of deteriorated timber stop log bays.
Spalling	Control tower has collapsed.
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	Stop log bays are inoperable and filled with debris.
Float Wells	N/A
Gate Hoist	
Elevator	

AREA EVALUATED	CONDITIONS	
<u>OUTLET WORKS - CONTROL TOWER (cont.)</u>	South Dam	North Dam
Hydraulic System	N/A	Stop log bays inoperable
Service Gates		
Emergency Gates		
Lightning Protection System		
Emergency Power System		
Wiring and Lighting System		

INSPECTION CHECKLIST

PROJECT	Rocky Lake Dams	DATE	11/28/78
PROJECT FEATURE	Transition, conduit	NAME	Cole, Bisson
DISCIPLINE	Structural, Civil Hydraulics/Hydrology	NAME	Decker

AREA EVALUATED	CONDITION	
<u>OUTLET WORKS - TRANSITION AND CONDUIT</u>	South Dam	North Dam
General Condition of Concrete	Old timber dam has been breached.	Deteriorated timber sill and training walls. Intact but badly rotted.
Rust or Staining on Concrete		
Spalling		
Erosion or Cavitation		
Cracking	NOT APPLICABLE	
Alignment of Monoliths		
Alignment of Joints		
Numbering of Monoliths		

PERIODIC INSPECTION CHECKLIST

PROJECT Rocky Lake Dams DATE 11/28/78

PROJECT FEATURE Outlet Structure, Channel NAME Cole, Decker

DISCIPLINE Structural, Geotechnical NAME Bisson  
Hydraulics/Hydrology

AREA EVALUATED	CONDITION	
<u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u>	South Dam	North Dam
General Condition of Concrete	Old timber dam	Outlet structure has been breached. consists of timber cribwork, badly rotted.
Rust or Staining		
Spalling		
Erosion or Cavitation		
Visible Reinforcing	NOT APPLICABLE	
Any Seepage or Efflorescence		
Condition at Joints		
Drain holes		
Channel		
Loose Rock or Trees Overhanging Channel	None	Trees in channel and on both sides of channel.
Condition of Discharge Channel	Bedrock, some cobbles and boulders. 8.8'x 11.8' culvert just below dam.	Channel bed consists of cobbles, gravel and boulders, no erosion evident.

INSPECTION CHECKLIST

PROJECT Rocky Lake Dams

DATE 11/28/78

PROJECT FEATURE Spillway

NAME Cole, Decker

DISCIPLINE Structural, Civil  
Hydraulics/Hydrology

NAME Bisson

AREA EVALUATED	CONDITION	
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	South Dam	North Dam
a. Approach Channel		
General Condition	Good	Good
Loose Rock Overhanging Channel	None	None
Trees Overhanging Channel	None	None
Floor of Approach Channel	Bedrock, gravel, cobbles, boulders	Could not be ob- served, ice
b. Weir and Training Walls		
General Condition of Concrete and Masonry	Timber dam breached.	Timber cribwork, very rotten.
Rust or Staining		
Spalling	NOT APPLICABLE	
Any Visible Reinforcing		
Any Seepage or Efflorescence		
Drain Holes		
c. Discharge Channel		
General Condition		
Loose Rock Overhanging Channel	None	None
Trees Overhanging Channel	None	Trees in channel
Floor of Channel	Bedrock, cobble and boulders	Gravel, cobbles an boulders
Other Obstructions	Culvert just down- stream	None

## INSPECTION CHECKLIST

PROJECT Rocky Lake Dam DATE 11/28/78

PROJECT FEATURE Service Bridge NAME Cole

DISCIPLINE Structural NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SERVICE BRIDGE</u>	
a. Superstructure	
Bearings	
Anchor Bolts	
Bridge Seat	
Longitudinal Members	NOT APPLICABLE
Under Side of Deck	
Secondary Bracing	
Deck	
Drainage System	
Railings	
Expansion Joints	
Paint	
b. Abutment & Piers	
General Condition of Concrete	
Alignment of Abutment	
Approach to Bridge	
Condition of Seat & Backwall	

## SUPPLEMENTARY INSPECTION NOTES

### ROCKY LAKE DAMS WHITING, MAINE

#### APPENDIX A

The Rocky Lake Dams consists of two structures about 400 feet apart and separated by an island. The spillway section of the southerly dam has been breached. The breached width is approximately 20 feet and the stream is flowing in its natural streambed through this opening. The northerly dam was found to be retaining approximately 10 feet of water.

#### 1. TIMBER STRUCTURES IN GENERAL

Both dams are constructed of stone-filled self-loading timber cribs. The timber members are seriously deteriorated and rotted. The broken timber members have become displaced and stone fill has fallen through. The penstock area and powerhouse at the southerly dam have collapsed and could not be inspected due to the hazardous condition of the dilapidated structure. The northerly dam, although seriously deteriorated is generally intact.

#### 2. EMBANKMENT STRUCTURES

An earth embankment dike, located approximately 150 feet upstream of the southerly dam, partially closes the southerly outlet from Rocky Lake. This embankment is approximately 6 feet high with about an 8 foot top width and 2 to 1 side slopes. This embankment has a grassed surface and appears to be well maintained with little or no brush growth apparent. This embankment appears to have been constructed subsequent to the breaching of the dam downstream.

The embankment does not entirely close off the southerly outlet channel. It appears that the embankment was either not extended across the channel or has been breached. The channel is partially filled with stones and retains approximately 1 to 2 feet of water.

- a. Settlement. The southerly earthen embankment dike section was found to be in good condition with little or no settlement.

- b. Slope Stability. The slopes of the embankment appear generally true to line and grade and no slope stability problem appears to exist.
- c. Seepage. Very minor seepage was occurring at the downstream toe of this structure.
- d. Drainage Systems. None were observed.
- e. Slope Protection. Logs were lying on the upstream slope of the northerly dam, a little above the water line. No other form of slope protection was in evidence. Little or no erosion was apparent on the upstream slope.

### 3. SPILLWAY STRUCTURES

The spillway structure at the southerly dam has been breached. The northerly dam has a timber self-loading timber deck spillway. The timber is seriously deteriorated and in poor condition. There are no control gates on the spillway.

- a. Control Gates and Operating Machinery.  
None operable.
- b. Unlined Saddle Spillways. The area north of the earth embankment dike upstream of the southerly dam is an unlined saddle spillway. It is about 40 feet in width, and consists of cobbles and boulders overlying bedrock.
- c. Approach and Outlet Channels. Southerly dam approach appears to be clear and unobstructed both at the embankment dike upstream and at the breached dam. The southerly dam outlet channel is generally unobstructed, however, a 8.8 foot wide by 11.4 foot high culvert exists approximately 110 feet downstream from the dam. Debris from the site could plug this culvert during high flow conditions. The approach channel to the northerly dam was generally clear. However, a beaver lodge exists approximately 30 feet upstream of the dam near the north bank and debris from this area could clog the spillway or outlet sections of the dam structure. The outlet channel is lined with trees and could be easily obstructed by debris from the dam or debris passing over the dam.

- d. Stilling Basin. The stilling basin at the southerly dam is a bedrock channel with no erosion apparent. The stilling basin at the northerly dam is a channel, no erosion was evident.
- e. Drawdown Facilities. There are no drawdown facilities at either dam. Although the south dam has been breached, the lake outlet channel has been partially filled with stone to a height of about 2 feet, and at low flows the stone fill controls hydraulically. The north dam gates are inoperable.

#### 4. OUTLET WORKS

There are no outlet works at the southerly dam. At the northerly dam there are two stop log outlet structures. One has been closed with vertical planking over the deteriorated stop logs. The other outlet has apparently been closed by debris and the work of beavers.

#### 5. SAFETY AND PERFORMANCE INSTRUMENTATION

There is no safety performance instrumentation at the dam.

#### 6. RESERVOIR

- a. Shoreline. No major active or inactive landslide areas on the Rocky Lake shoreline were observed.
- b. Sedimentation. The extent of sedimentation in the pond could not be observed during the visual inspection, but it does not appear to impede flow to either of the two dams.
- c. Potential Upstream Hazard Area. No significant upstream hazard was observed.
- d. Watershed Runoff Potential. The watershed is essentially rural with flat to mildly sloping terrain.

#### 7. DOWNSTREAM CHANNEL

The channels below the northerly and southerly dams are narrow with a slope of about 0.7 percent. See Photographs 5 and 7. Both streambeds are composed primarily of gravel and cobbles. Located about 100 feet downstream of the southerly dam is an 8.8 foot wide by

11.8 foot high culvert beneath a road. This culvert appears to restrict the channel and is the hydraulic control during flood flow. The north channel is littered with debris, including two fallen trees. The two channels join as they enter Orange Lake about 1500 feet downstream of the dams.

#### 8. OPERATION AND MAINTENANCE FEATURES

- a. Maintenance. Based on the observations made and information reported by a local resident, no maintenance has been performed on the dam in the past 10 years. It was reported that the southerly dam was breached approximately 10 years ago.

APPENDIX B  
ENGINEERING DATA

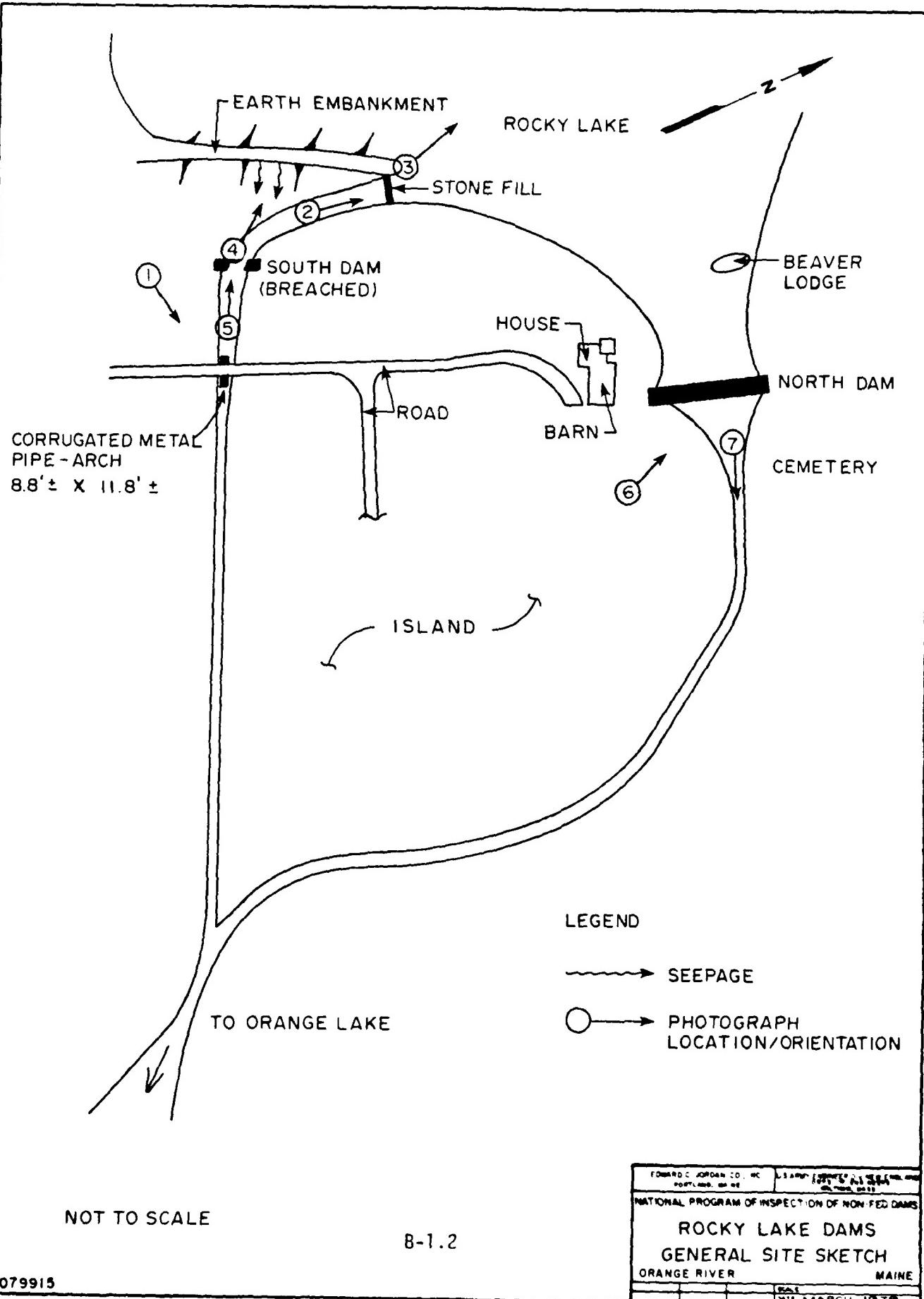
This appendix lists the engineering data collected either from project records or other sources of data developed as a result of the visual inspection. The contents of this appendix are listed below.

<u>Appendix</u>	<u>Description</u>
B-1	General Project Data

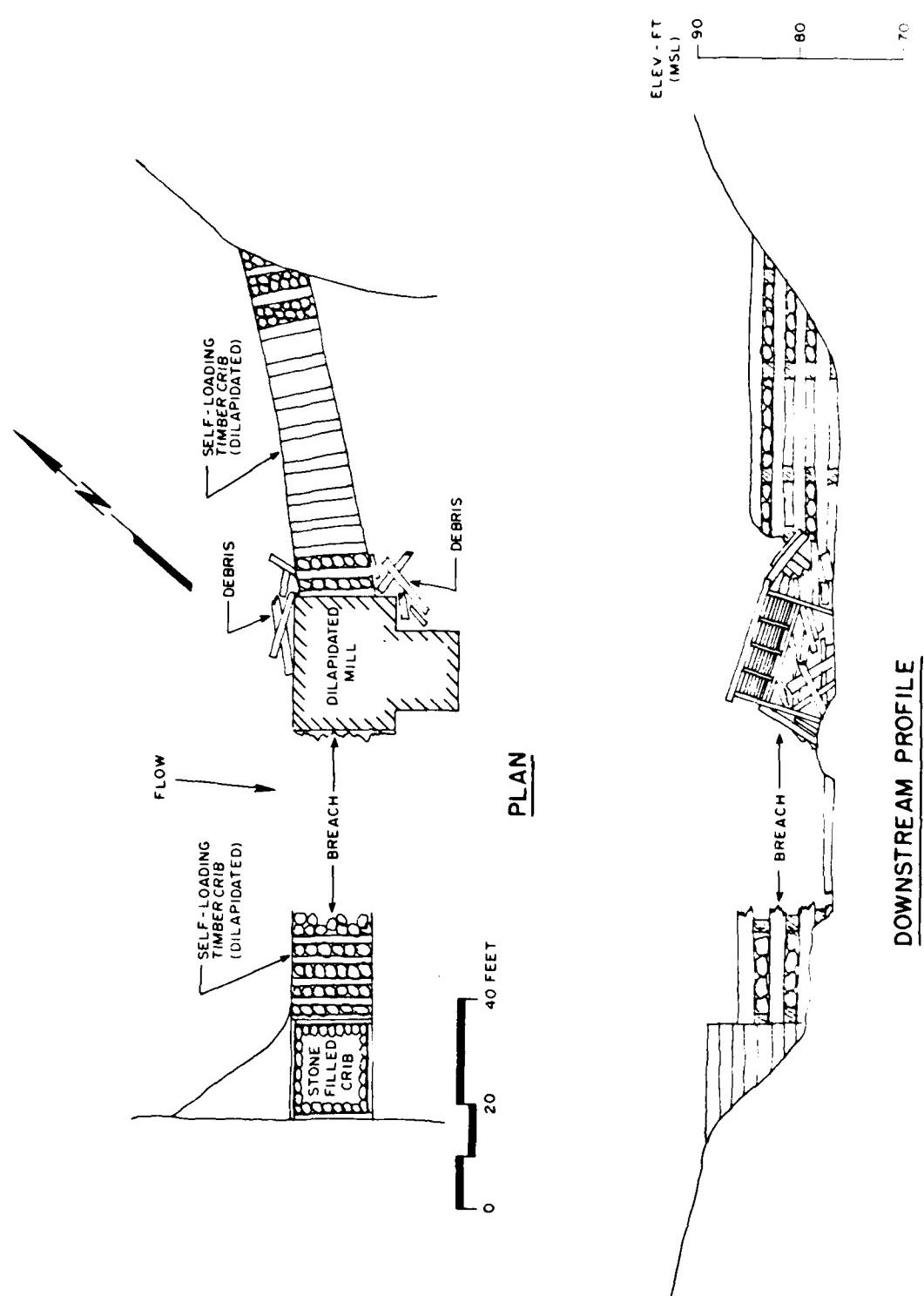
## APPENDIX B-1

### GENERAL PROJECT DATA

The following plan, profile and cross-sections of the dams were developed from a limited stadia survey performed during visual inspection, field notes taken by inspection team members, and photographs taken during the visual inspection. The survey was referenced to an arbitrary local datum. Approximate U.S.G.S. elevations were obtained by noting the dam's location on the Gardner Lake, Maine U.S. Geologic Survey quadrangle and assuming that the spillway crest of the northerly dam to be equal to normal water surface of approximate elevation 90 (MSL).



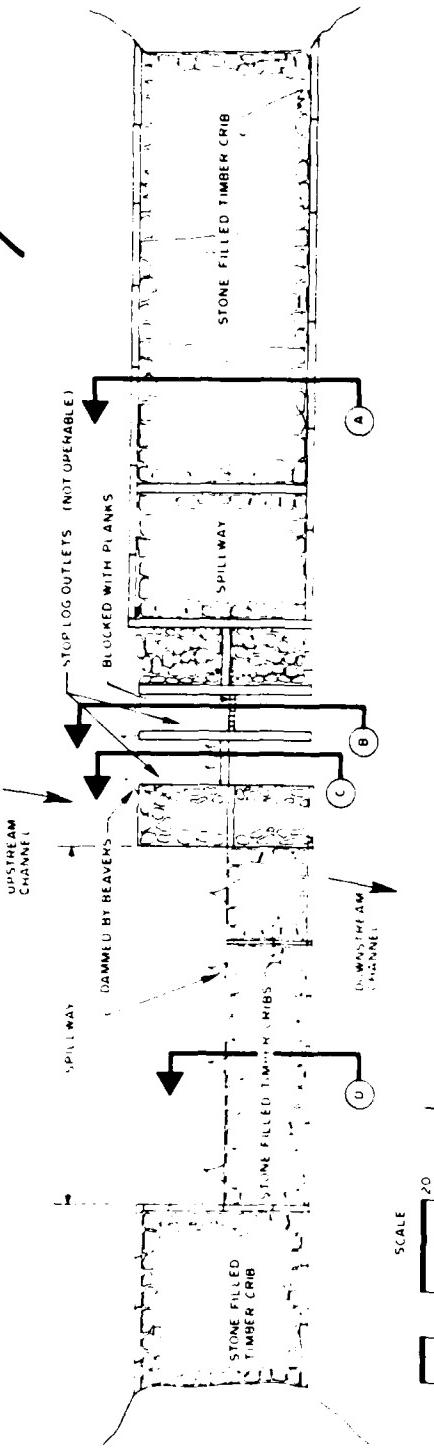
EDWARD C. JORDAN CO., INC.	LARRY JORDAN, P.E.
PORTLAND, ME 04102	307-773-2111
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
ROCKY LAKE DAMS	
GENERAL SITE SKETCH	
ORANGE RIVER	MAINE
DATE MARCH 1979	



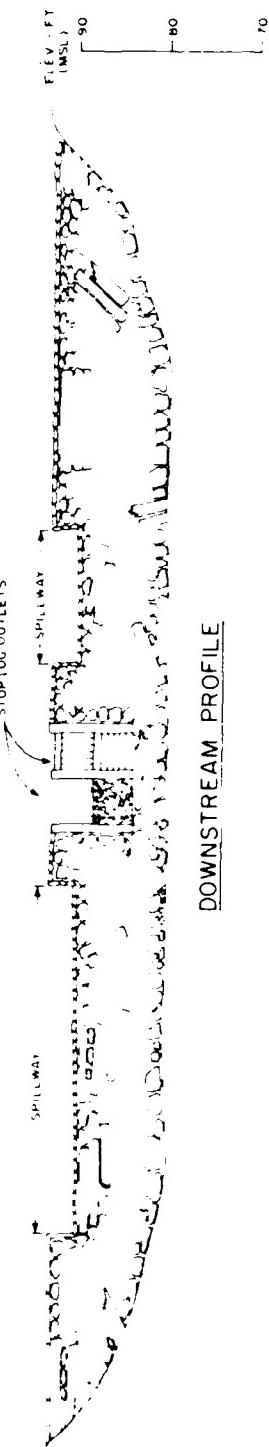
EDWARD J. O'ROURKE, JR.	U.S. ARMY ENGINEER FOR NEW ENGLAND PROFESSOR OF HYDRAULICS
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
ROCKY LAKE DAMS	
SOUTHERLY DAM	
PLAN AND PROFILE	
ORANGE RIVER	MAINE
Scale	1:10000
Date: MARCH 1978	

2079915

B-1.3



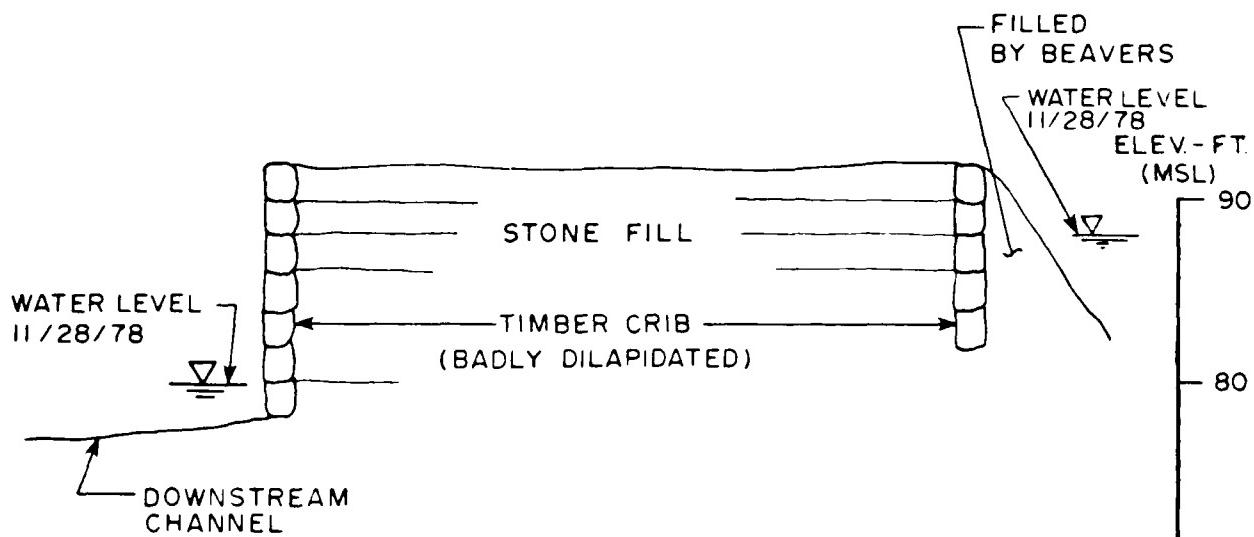
PLAN



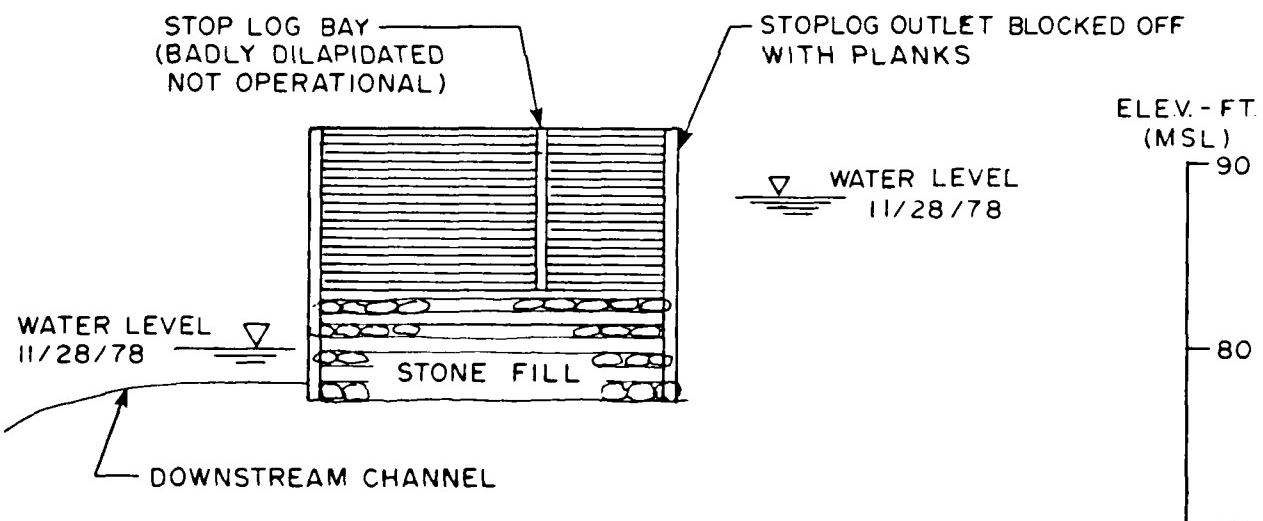
FORWARD: JORDAN, J. MC	U.S. ARMY CORPS OF ENGINEERS PORTLAND, ME 04102 MILITARY MAIL ADDRESS
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS	
ROCKY LAKE DAMS NORTHERLY DAM PLAN AND PROFILE ORANGE RIVER MAINE	
DATE: MARCH 14, 1975	

2079915

B-1.4



SECTION A



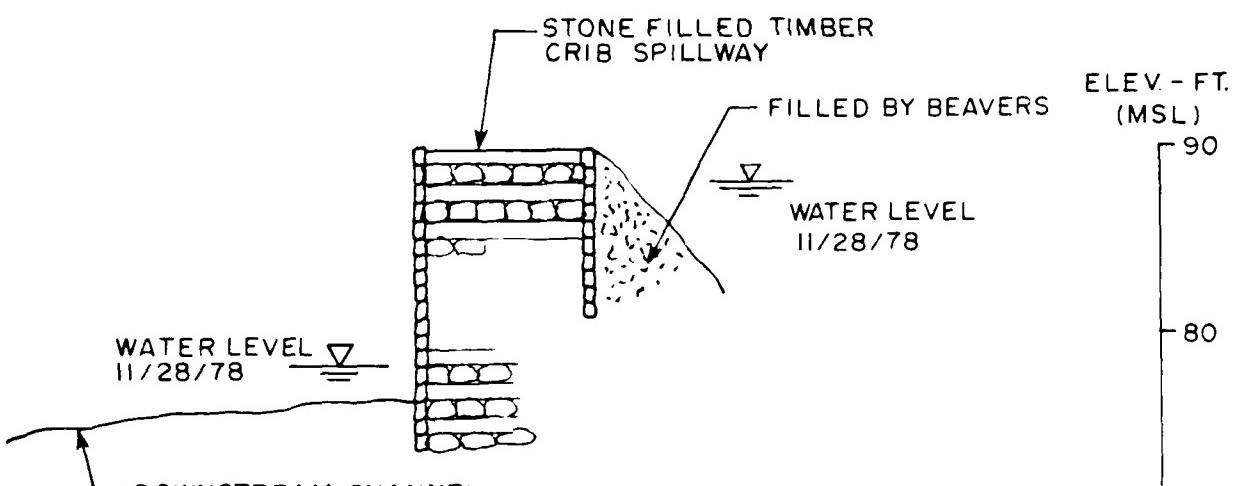
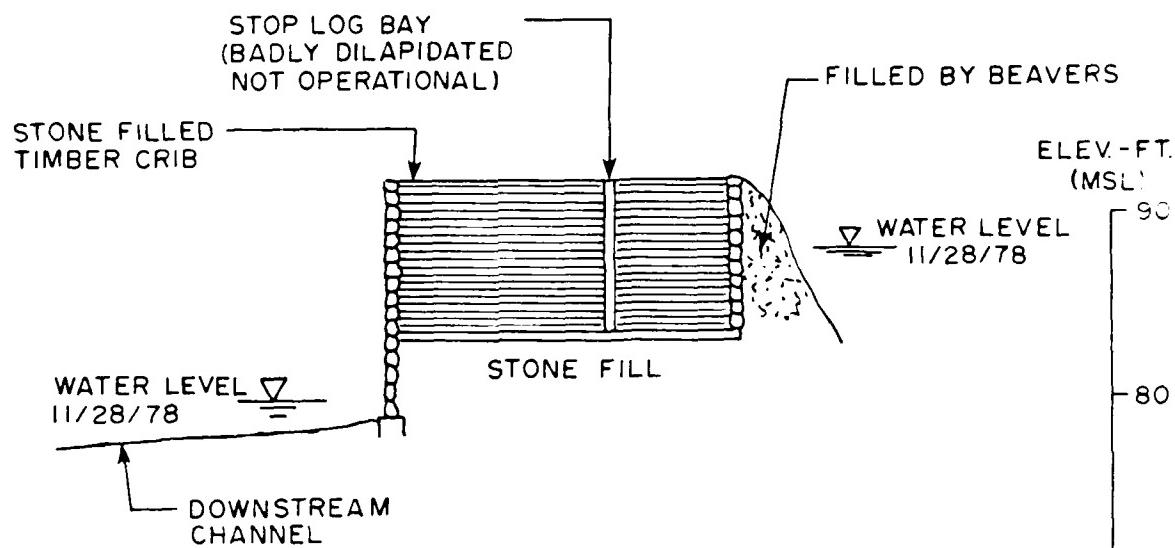
SECTION B

0 5 10 15 FEET  
2079915

B-1.5

EDWARD JORDAN CO., INC.	U.S. ARMY CORPS OF ENGINEERS
ROCKY LAKE DAMS	MAINE
ROCKY LAKE DAMS	NORTHERLY DAM
X-SECTIONS	
ORANGE RIVER	KAT
11-1973	

NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS  
ROCKY LAKE DAMS  
NORTHERLY DAM  
X-SECTIONS  
ORANGE RIVER MAINE  
11-1973



SECTION D

0 5 10 15 FEET  
2079915

B-1.6

FORWARD ARROW	U.S. ARMY CORPS OF ENGINEERS
PORTLAND, ME	DETROIT, MI
NATIONAL PROGRAM OF INSPECTION OF NON-FEEDBACK DAMS	
ROCKY LAKE DAMS	
NORTHERLY DAM	
X-SECTIONS	
ORANGE RIVER	MAINE
DATE	11-14-78

APPENDIX C

PHOTOGRAPHS

The following are photographs referenced in this report.  
See Sheet B-1 for photograph locations and orientations.

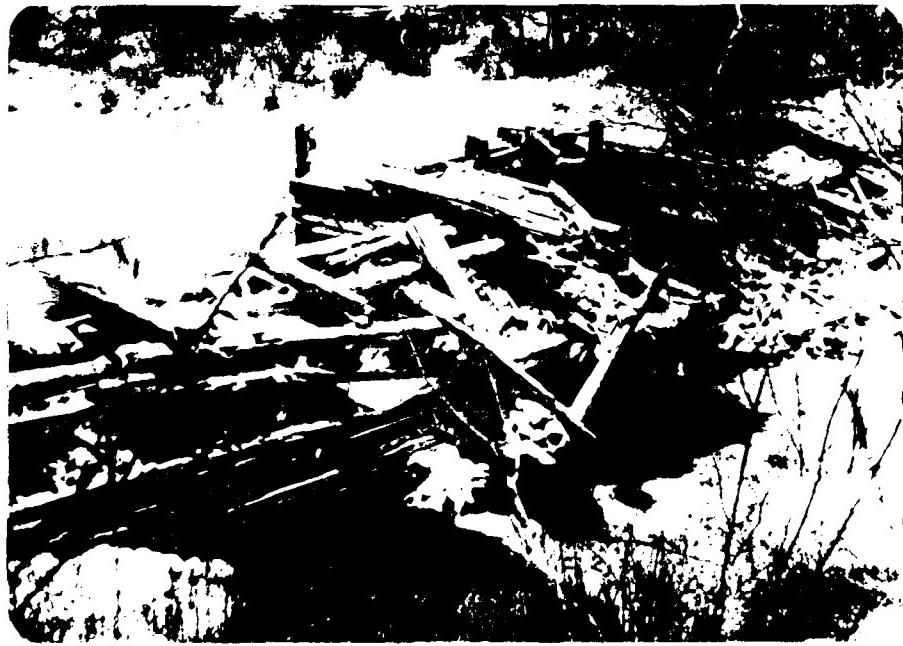
C-1

Rocky Lake Dam



1

SOUTH DAM - DOWNSTREAM FACE



2

NORTH DAM - DOWNSTREAM FACE



3

UPSTREAM CHANNEL



4

SOUTH DAM - EARTH DIKE UPSTREAM



5

SOUTH DAM - DOWNSTREAM CHANNEL.



6

SOUTH DAM - UPSTREAM CONTROL.



7

NORTH DAM - DOWNSTREAM CHANNEL



3

UPSTREAM CHANNEL



4

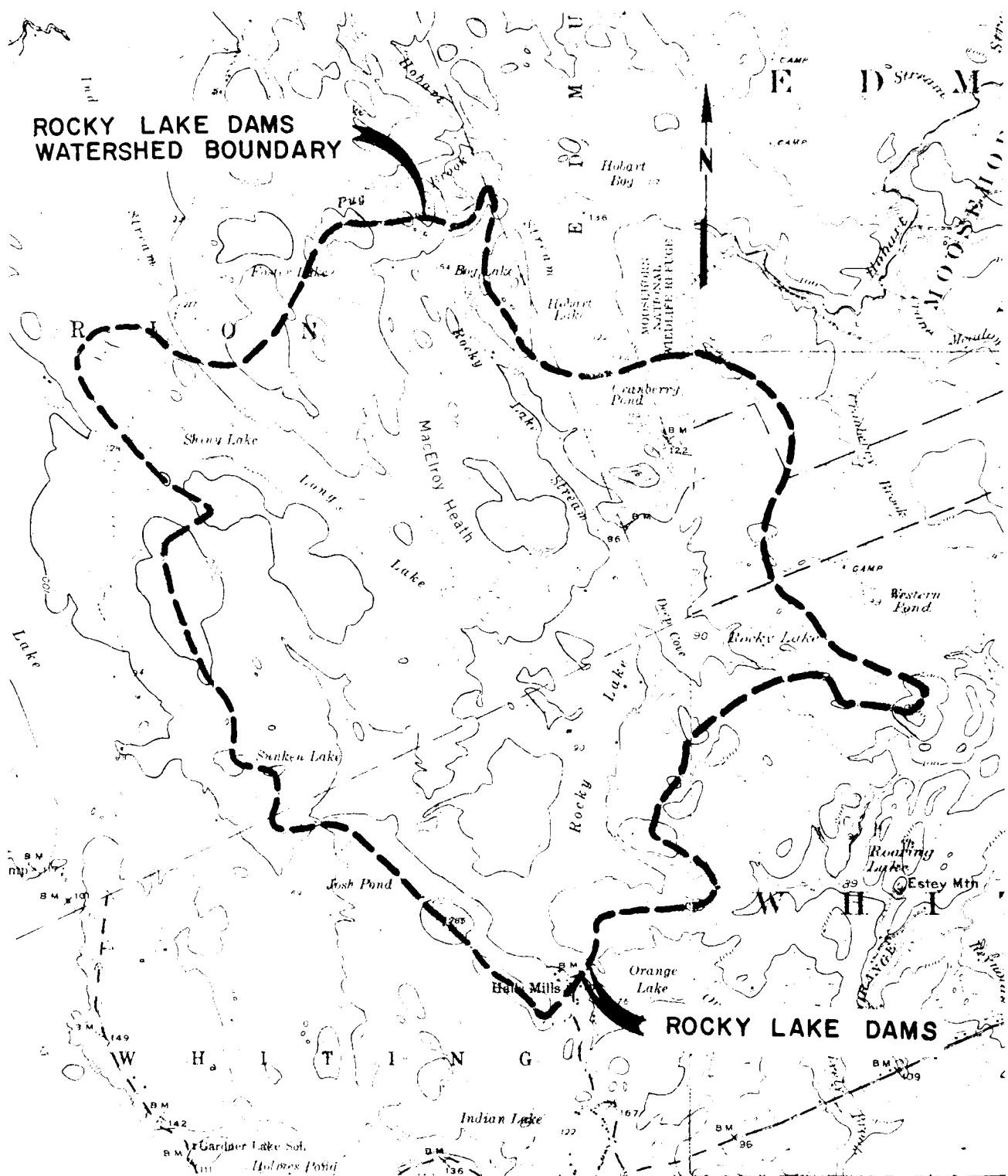
SOUTH DAM - EARTH DIKE UPSTREAM

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

Hydrologic computations pertinent to this investigation are attached. The following Location and Drainage area map shows the Rocky Lake watershed at the Rocky Lake Dams.

# ROCKY LAKE DAMS WATERSHED BOUNDARY



U.S. GEOLOGICAL SURVEY MAP  
GARDNER LAKE, ME. QUADRANGLE  
EASTPORT, ME. QUADRANGLE

0 1 2 3 MILES

1 APR 1979	1 MAY 1979	DEMOCRATIC NATIONAL CENTRAL COMMITTEE WATER BANK
NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS		
<b>ROCKY LAKE DAMS</b>		
<b>LOCATION &amp; DRAINAGE AREA MAP</b>		
<b>ROCK LAKE</b>	<b>ME.</b>	
2078915	AS SHOWN	MARCH 1979

EDWARD C. JORDAN CO., INC.

PROJECT

STOKE AND DISCHARGE PATTERNS  
FOR WINTER AND SPRING LOADS

COMP BY

STC

JOB NO.

2-7-75

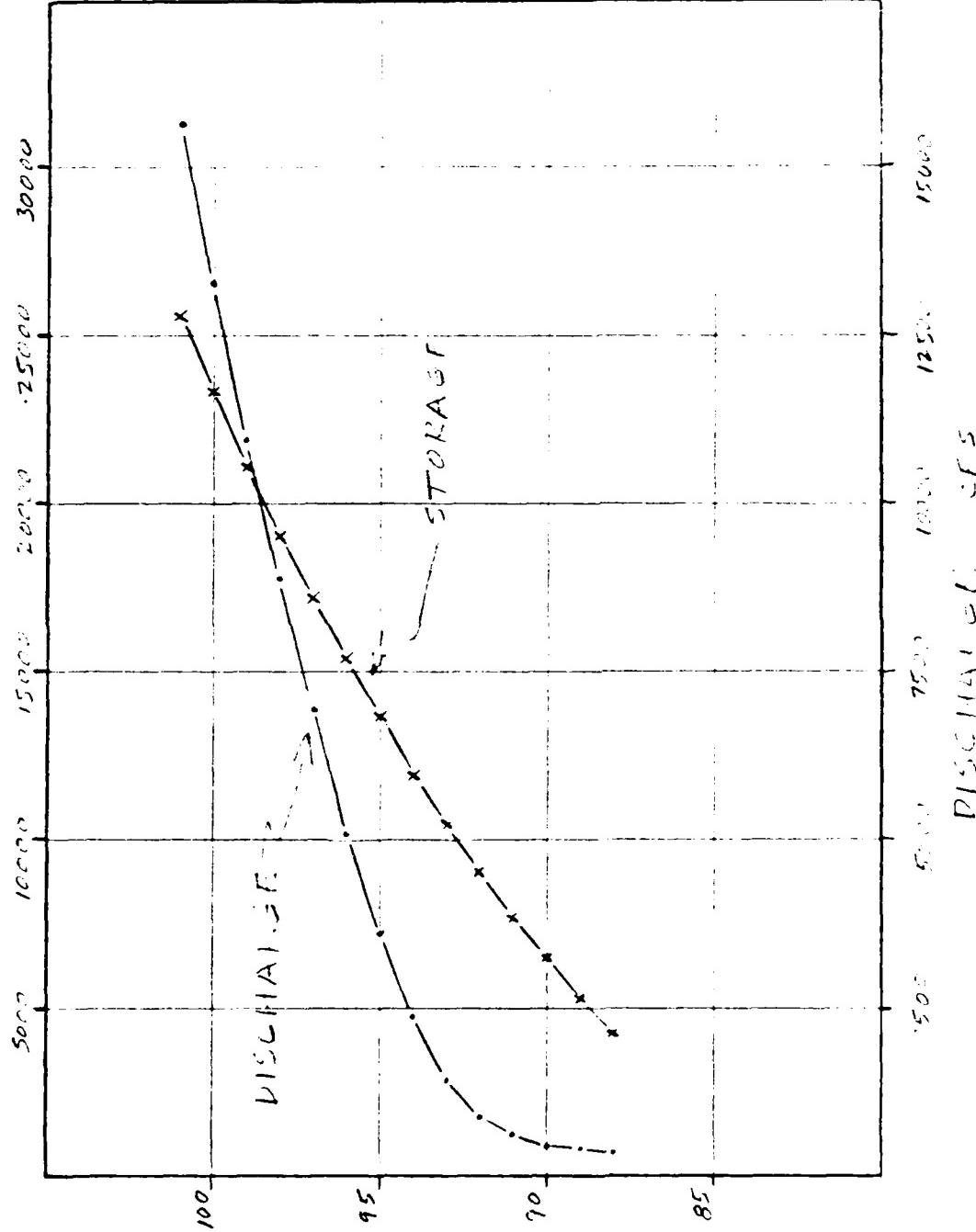
CHK BY

STC

DATE

12-12-75

STOKE AND DISCHARGE PATTERNS



ELEVATION ABOVE MSL

D-3

Rocky Lake Dam

PROJECT	COMP BY	JOB NO.
ELK RIVER	STL	E-100-15
ED. 100 LAKES	CHK BY	DATE
ED. 100 LAKES	LLC	2-5-77

ITEM	IN'	ACTA IN'	A.F.A. ACTA
Rocky Lake DA	16.7	16.7	10752
Rocky Lake @ EL 70	1.70	1.60	1152
Rocky Lake @ EL 100	3.43	3.43	2195
Orange Lake @ EL 70	6.20	6.00	2711
Orange Lake @ EL 76	6.38	6.38	243
Orange Lake @ EL 80	0.66	0.60	422
Orange Lake @ EL 100	1.16	1.16	742

### EDDA COE INVENTORY OF LAKES

Normal Impounding Capacity = 65 A.-ft  
 Maximum " " = 7400 A.-ft

Normal capacity = 65 A.-ft

Maximum Capacity @ Top of Dam  
 (@ EL 76):

$$6510 + [1152 + (2195 - 1152) \left( \frac{76}{70} \right)] \approx \underline{\underline{9020 \text{ A.-ft}}} \quad \leftarrow$$

To be used for  
 max. capacity

PROJECT	COMP BY	JOS NO.
Rocky Lake Dam	171	2-7711-15
	CHK BY	DATE

WEIR

DESIGNATIONLEVEE C

North Dam

95 Variet. $\leftarrow$ 

North Dam Spillway

54 "

South Dam

63 "

<sup>1</sup> South Dam is breached. Any weir flow at the South Dam site would be over the roadway just downstream of the dam.

## 5-40 HANDBOOK OF HYDRAULICS

## KING &amp; BRATER

Table 5-3. Values of C in the Formula  $Q = CLH^{1/2}$  for Broad-Crested Weirs

Measured head in feet, $H$	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.02	2.00	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.56	2.70
0.6	3.08	2.69	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.70
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.75	2.68	2.64	2.65	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.08	2.86	2.70	2.65	2.64	2.67	2.68	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.65	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.68	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.58	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

PROJECT ROCKY LAKE DAM HYDRAULICS	COMP BY BT	JOB NO. E-711
ANNUAL DATA	CHK BY S	DATE 1-1-77

YEAR	Sp. Wt / HEAD ft. +	Flow / GPM	Loss -HEAD ft. +	Q AM ft. cfs	Q PM ft. cfs
90	1	-		-	143
91	2	143		-	403
92	3	741	1	250	911
93	4	1140	2	727	1847
94	5	1514	3	1298	2814
95	6	2015	4	1999	3421
96	7	2643	5	2793	4172
97	8	3266	6	3672	4626
98	9	3249	7	4371	5161
99	10	4525	8	5653	6477
100	11	5221	9	6746	7447
101	12	5726	10	7901	8611
102	13	6682	11	9115	9714
103	14	7438	12	10386	1111
104	15	8312	13	11711	1271
105	16	7112	14	13563	1453
106	17	7112	15	14553	1553
107	18	10122	16	15753	1675
108	19	11202	17	17253	1825
109	20	12751	18	19253	2121

PROJECT	SOUTH	COMP BY		JOB NO.	
		LTI	LTII	LTIII	LTIV
ROCKY LAKE DAM	SOUTH				

2 = 100' 0"

REACHES

REACH	SOUTH ALFA ft.	SOUTH ELEVA ft.	SOUTH ELEVA ft.	SOUTH ELEVA ft.	TOTAL SOUTH ELEVA ft.
7	2.0	-35			35
8	18.1	102			102
9	34.3	193			193
10	50.5	284			284
11	66.1	371			371
12	77.4	435			435
13	81.7	457			457
14		27			27
15		40			40
16		52			52
17		53			53
18		14			14
19		23			23
20		23			23
21		30			30
22		31			31
23		39			39
24		41			41
25		46			46
26		53			53
27		61			61
28		71			71
29		74			74
30		83			83
31		87			87
32		95			95
33		96			96
34		109			109
35		113			113

1. Since no in footer no 1 was  
selected for storage in the dam  
it will be 10 foot.

PROJECT	COMP BY	JOB NO.
STORAGE - ELEVATION TAKE	BTE	E-5791-15
	CHK BY	DATE
	GG	E-5-7-7

NS - LAT IT'	TETHA - FLAT	STORAGE <sup>1</sup> ACR - FT
ELEV	FEET	

88	371	4236
	403	5352
70	435	6510
	570	7714
71	562	8223
	1450	10435
74	2133	11551
	3917	12574
96	5121	15291
	6155	17131
98	8234	17064
	10957	21127
100	13040	20247
	1564	23555
102	18248	27974
	20755	30573
104	23711	33211
	26746	36340
106	27216	39465
	3303	42765
108	34276	42231
	37215	47511
110	42194	53675

<sup>1</sup> Normal water surface taken as E.L. FE.

PROJECT	COMP BY	JOB NO.
KATIE - Erosion Control	BTC	2077-15
	CHK BY	DATE
	LL	2-5-70

According to "PRELIMINARY GUIDANCE FOR ESTIMATING MAXIMUM DRAINAGE DISCHARGE" by CCEI

For Flat D.A. = 10 + 1/2 H., Q = 650 CFS

$$Q = 650 \times (1.0) = 1075 \text{ CFS} = \text{PMF}$$

$$5460 \text{ CFS} = \frac{1}{2} \text{ PMF}$$

ESTIMATING EFFECT OF SURCHARGED STORAGE:

$$Q_{P_2} = Q_{P_1} \times \left(1 - \frac{\text{STOKE}_1}{\text{Pmff}}\right)$$

$$\text{PMF Elevation} = 19'' ; k_2 = 0.5 ; \text{Runoff} = 9.5''$$

$$\text{Elev} + \text{pmff} = Q_{P_2} (\text{PMF}) = 17.5'$$

$$\text{STOKE}_1 = 21.10 - 4.0 = 16.10 \text{ A.L. ft.}$$

$$\text{or } \frac{16.10}{1075} \times 12 \text{ in.} = 1.826''$$

$$Q_{P_2} = 10920 \left(1 - \frac{1.826}{1.7}\right) = 52$$

$$\text{STOKE}_2 \approx 0$$

$$Q_{P_3} = 10920 \left(1 - \frac{(1.826 + 0)/2}{1.7}\right) = 5500$$

$$\text{Elev to pass } Q_{P_3} = 16.2$$

PROJECT	COMP BY	JOB NO.
Rocky Lake Dam	LTC	227115
	CHK BY	DATE
	CC	2-5-71

$$STOK_3 = 15.22 - 4.22 = 11.47 \text{ ft. ft}$$

or  $\frac{11.47}{1075} \times 12 = 1.2 \text{ ft.}$

$$STOK_{AVG} = \frac{12.2 + 1.2}{2} = 11.2 \text{ ft.}$$

$$Q_{P4} = 10920 \left(1 - \frac{11.2}{17}\right) = 4520 \text{ cfs}$$

$$\text{Elev. to pass } Q_{P4} = 95.6$$

$$STOK_4 = 14.622 - 4.06 = 10.416 \text{ ft. ft}$$

or  $\frac{10.416}{1075} \times 12 = 11.63 \text{ ft.}$

$$STOK_{AVG} = \frac{11.2 + 11.63}{2} = 11.4 \text{ ft.}$$

$$Q_{P5} = 10920 \left(1 - \frac{11.4}{17}\right) = \underline{\underline{4354}} \text{ cfs}$$

$$\text{Elev. to pass } Q_{P5} = \underline{\underline{95.5}}$$

PROJECT	COMP BY	JOB NO.
Y PA	ET	23711-15
	CHK BY	DATE

Elev to pass Gps 1 = 546.1 ft  
is 93.2'.

$$STO_{1,1} = 10432 - 42.0 = 10430 \text{ ft. - ft}$$

$$\text{OR } \frac{11430}{10750} \times 12 = 12.76''$$

$$G_{P2} = 546.1 - \frac{12.76}{9.5} < 0$$

$$\therefore STO_{1,2} = 0, \text{ & } STO_{Ave} = \frac{12.76}{2} = 6.38''$$

$$G_{P2} = 546.1 - \frac{6.38}{9.5} = 17.73 \text{ ft.}$$

Elev to pass Gps 3 = 93.4

$$STO_{1,3} = 10432 - 42.0 = 10430 \text{ ft. - ft}$$

$$\text{OR } \frac{10430}{10750} \times 12 = 7.61''$$

$$STO_{1,3} = 7.61 - 7.00 = 0.61''$$

$$G_{P3} = 546.1 - \frac{0.61}{9.5} = 1440 \text{ ft.}$$

Elev to pass Gps 4 = 93.0

$$STO_{1,4} = 10432 - 42.0 = 10430 \text{ ft. - ft}$$

$$\text{OR } \frac{10430}{10750} \times 12 = 6.95''$$

$$STO_{Ave} = 6.95 + 7.00 = 13.95''$$

$$G_{P4} = 546.1 - \frac{13.95}{9.5} = \underline{\underline{1451 \text{ ft.}}} \\ \text{D-11} \quad \text{OR } \underline{\underline{FL 92.0}}$$

Rocky Lake Dam

PROJECT	COMP BY	JOB NO.
Rocky Lake Dam - 100-100	LTD	100-100
	CHK BY	DATE

$$Q_p = \frac{C}{100} A_e \sqrt{Y_0} Y_1^{3/2}$$

$$Y = Q_p T = 12.1 \text{ cfs}$$

Normal head is most conservative.  
so  $Y_1 = 14'$

$$\therefore Y_0 = 0.4 (14) = 5.6$$

$$Y_1 = 14'$$

$$Q_p = \frac{C}{100} (5.6) \sqrt{14} = 5.4 \text{ cfs}$$

Top of Dam = EL 92

Allowable Factor of Safety = 1.5  
Safety Factor = 4.0 / 1.5 = 2.67

Total Failure Flow  $\approx \underline{5700 \text{ cfs}}$

Storage =  $\sim 9000 \text{ Acre-ft}$

$$T = \frac{12.1 (9000)}{Y_2 (5700)} = \underline{38.3 \text{ hrs}}$$

<sup>1</sup> Failure is assumed to occur through the spillway section. Therefore, no additional flow is added to the total failure flow for spillway discharge.

EDWARD C. JORDAN CO., INC.

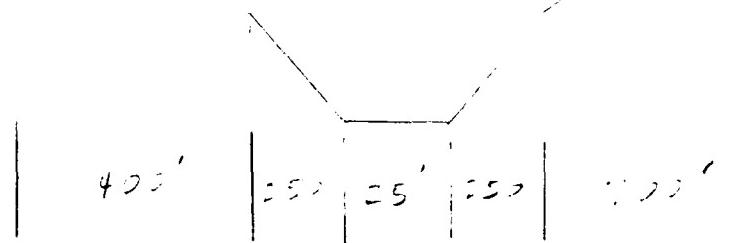
PROJECT	COMP BY	JOB NO.
STOKE - D 31-A	E7A	100-151
CHK BY	DATE	5-6-77

DAM ELEVATION

107

-20

-76



$$\text{Slope} = \frac{107 - 76}{420} = 0.0027$$

ELF	A	A	A	FT
ELF	STAGE	STAGE	STAGE	

$$Q = \frac{1.41}{2} A^2 \sqrt{2g(h + \frac{A}{2})}$$

D-30118-5-1

73 240 -

20	420	130	118
1	420	130	118
2	420	130	118
3	420	130	118
4	420	130	118
5	420	130	118
6	420	130	118
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279	420	130	118
280	420	130	118
281	420	130	118

PROJECT

LAWRENCE BERKELEY NATIONAL LABORATORY

D. Failure Hydrographs

COMP BY	JOB NO.
LTC	20737 15
CHK BY	DATE
SCH	2-6-77

$$g_{p_1} = 5700 \text{ ft/s}$$

AT OUTLET OF ORANGE POND

$$g_{p_2} @ EL 83.4$$

$$V_1 = 2651 \text{ ft/s}$$

$$g_{p_1} (\text{TRAIL}) = g_{p_2} \left(1 - \frac{V_1}{V_2}\right)$$

$$g_{p_1} (\text{TRAIL}) = 5700 \left(1 - \frac{2651}{9120}\right) = 4555 \text{ ft/s}$$

$$g_{p_2} (\text{TRAIL}) @ EL 83.4, V_2 = 2424 \text{ ft/s}$$

$$g_{p_2} = 5700 \left(1 - \frac{2651 + 7245/2}{9120}\right) = \underline{\underline{4155 \text{ ft/s}}}$$

$$\underline{\underline{3 EL 72.4}}$$

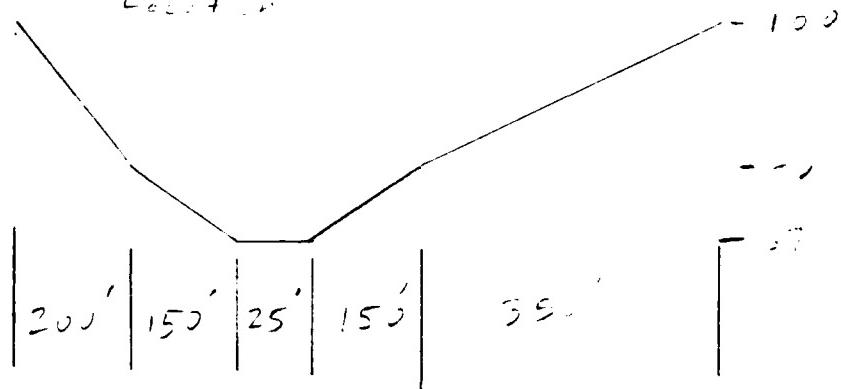
or Approx. 6 ft  
above normal pool  
EL = 72.4

$$T = 12.1 \frac{1}{\sqrt{g_{p_2}}} = 52.5 \text{ hrs}$$

PROJECT	STORAGE - DISCHARGE	COMP BY	JOB NO.
AT FIRST BRIDGE BELOW		ZTB	Z-77-15
ORANGE LAKE		CHK BY	DATE

3000 cu ft. = 0.03

X-Sect = 100 - 100' x  
Locat. 200'



$$\text{Slope} = 5 : 1.7$$

FLFV	Area Ac.	Ac. Ft.	$\Delta = 1 \frac{1}{4}$ $A = 3 \frac{1}{2}$ DISCHARGE, CFS
	STORAGE	STORAGE	
67	-	-	
	14	7	
	28	21	
70	41	62	182
	55	115	
	69	172	
	83	240	
	76	337	
75	116	441	1667
	124	556	1217
	132	672	2263
	151	833	3213
	155	911	4072
80	177	1164	5472

PROJECT	COMP BY	JOB NO.
Dam Failure Hydrograph	5-1	2070-15
CHK BY		DATE
		2-6-79

$$Q_p = 4155$$

AT DRAG = 2 = MILES DOWNSTREAM  
OF DAM.

$$q_p = @ \text{ EL } 78.6'$$

$$V_1 = 933 \text{ A.s ft}$$

$$Q_p = (TRAC) = 4155 \left(1 - \frac{933}{932}\right) = 3725 \text{ cfs}$$

$$q_p = TRAC = @ \text{ FL } 72.1', V_2 = 854 \text{ A.s ft}$$

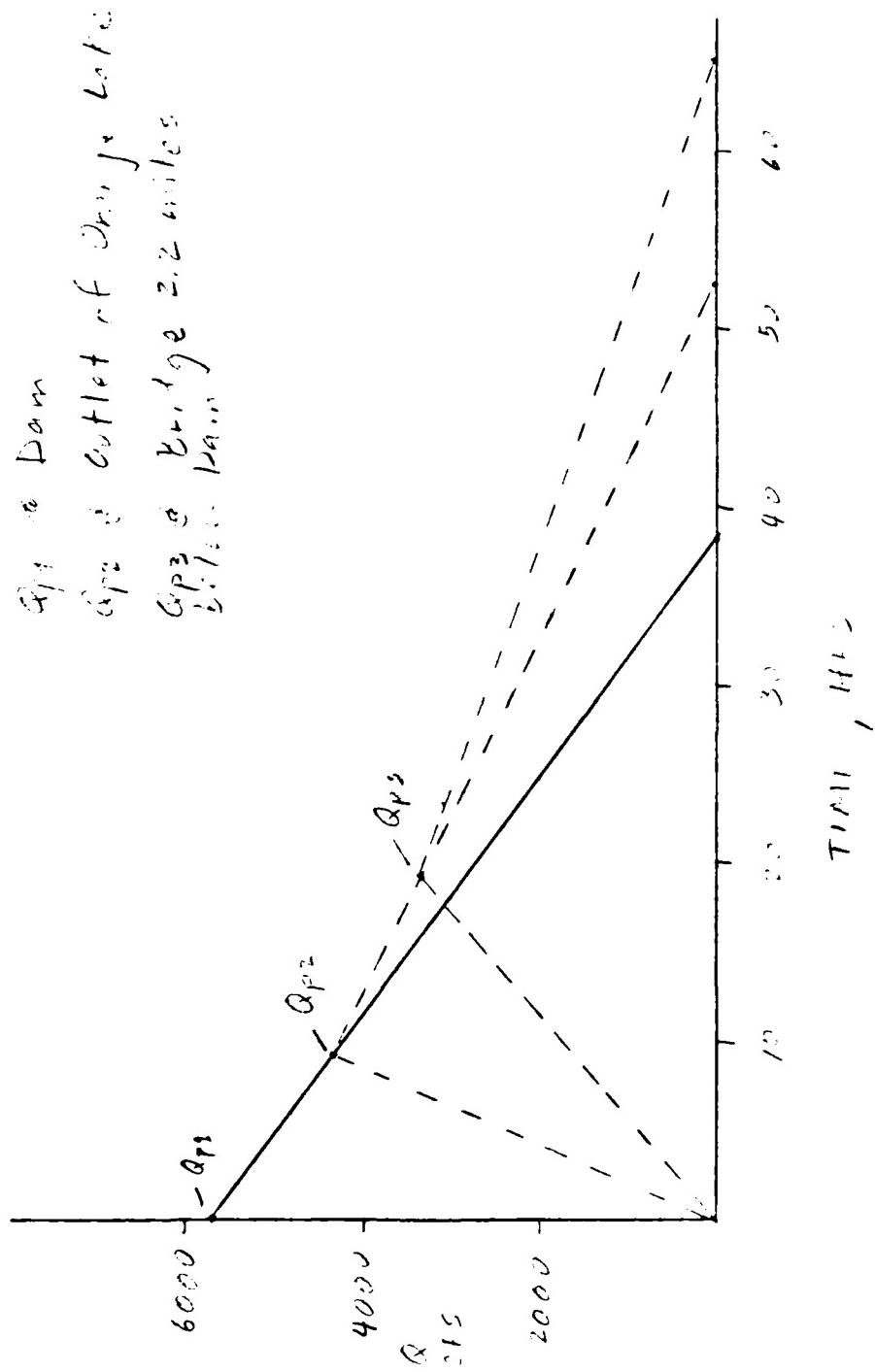
$$Q_p = 3725 \left(1 - \frac{(932 + 854)/2}{932}\right) = 3750 \text{ cfs}$$

$$@ \underline{\text{FL } 77.7'}$$

Proposed stage of 1.5 L. is likely to stay  
before the dam and would be maintained  
within the dam design as shown  
on the F.A.P. or 1955 map.

$$T = \frac{12.1 \times 65}{4 \times 32} = \underline{\underline{65 \text{ hrs}}}$$

PROJECT		COMP BY	JOB NO.
PA. FA - 1	NOV 1965	11/12	111-1
CPI 3	CHK BY	DATE	11/12



D-17

Rocky Lake Dam

PROJECT CLASSIFICATION	COMP BY BTL	JOS NO. 2071115
	CHK BY RJD	DATE 2-6-77

ACCORDING TO "RECIMAELE,  
GUIDELINES FOR SAFETY INSPECTION  
OF DAMS":

Ko.L. Lake Dam is a ~~medium~~ <sup>medium</sup> height  
should dam,  $\text{Storage} = 7,720 \text{ A.-Ft}$   
 $\text{Height} = 14'$

From Guidelines  $\rightarrow$  Storage  $\geq 10,000 \text{ A.-Ft}$  or  
 $\text{Height} \geq 40 \text{ or } < 100$

Hazard Potential Classification:

LOW

∴ Required Spillway design fl. is  
100% to  $\lambda_2 \text{ PMF}$ .

USE  $\lambda_2 \text{ PMF}$

Rooted  $\lambda_2 \text{ PMF} = 1450 \text{ cfs at EL 93.0}$

Capacity of dam at Top of Dam  
 $EL 93 = 8,500 \text{ cfs}$

Spillway Capacity =  $57\%$  of  $\lambda_2 \text{ PMF}$

APPENDIX E

Information as Contained in the National  
Inventory of Dams

E-1

Rocky Lake Dam

# INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE NUMBER	(2) DIVISION	(3) COUNTY	(4) STATE DIST.	(5) COUNTY DIST.	(6) CONC.	(7) NAME	(8) LATITUDE NORTH	(9) LONGITUDE WEST	(10) REPORT DATE DAY MO YR
4E	174	110	109	62		ROCKY LAKE DAM	4446.1	6715.4	22 APR 79

(11) FOUNDRY NAME	(12) NAME OF IMPOUNDMENT							
	ROCKY LAKE							

(13) REGION (AUX)	(14) RIVER OR STREAM	(15) NEAREST DOWNSTREAM CITY - TOWN - VILLAGE							
111	ROCKY LAKE STREAM	WHITING							
(16) TYPE OF DAM	(17) YEAR COMPLETED	(18) PURPOSES							
PERM	1964	WATER SUPPLY, IRRIGATION, NAVIGATION, FLOOD CONTROL, HYDRO POWER							
(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	

(28) REMARKS									

(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)
OF SHIPWAY HAS CRUST. (TYP.)	TYPE	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (KWH)	INSTALLED (KWH)	NO. OF SPANNING GATES			
150	11	54	400	4200	4200	4	4	4	4
(39)	(40)	(41)	(42)	(43)	(44)	(45)	(46)	(47)	(48)

(49) OWNER	(50) ENGINEERING BY							
" GAMBEL & HARRIS, CALIFORNIA	CONSTRUCTION							
(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	

(59) DESIGN	(60) CONSTRUCTION	(61) REGULATORY AGENCY	(62) OPERATION	(63) MAINTENANCE
PERF	NON			
(64)	(65)	(66)	(67)	(68)

(69) INSPECTION BY	(70) INSPECTION DATE							
PAUL CO. JOURNAL CO. INC.	DAY MO YR							
(71)	(72)	(73)	(74)	(75)	(76)	(77)	(78)	

PERIODIC INSPECTION 92-567 AUG 1972

(79) REMARKS									

This Phase I Inspection Report on Rocky Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

*Joseph W. Finegan*  
JOSEPH W. FINEGAN, JR., MEMBER  
Water Control Branch  
Engineering Division

*Carney M. Terzian*  
CARNEY M. TERZIAN, MEMBER  
Design Branch  
Engineering Division

*Joseph A. McElroy*  
JOSEPH A. MCELROY, CHAIRMAN  
Chief, NED Materials Testing Lab.  
Foundations & Materials Branch  
Engineering Division

APPROVAL RECOMMENDED:

*Joe B. Fryar*  
JOE B. FRYAR  
Chief, Engineering Division

This Phase I Inspection Report on Rocky Lake Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

*Joseph W. Finegan*  
JOSEPH W. FINEGAN, JR., MEMBER  
Water Control Branch  
Engineering Division

*Carney M. Terzian*  
CARNEY M. TERZIAN, MEMBER  
Design Branch  
Engineering Division

*Joseph A. McElroy*  
JOSEPH A. MCELROY, CHAIRMAN  
Chief, NED Materials Testing Lab.  
Foundations & Materials Branch  
Engineering Division

APPROVAL RECOMMENDED:

*Joe B. Fryar*  
JOE B. FRYAR  
Chief, Engineering Division

**INVENTORY OF DAMS IN THE UNITED STATES**

(1) DATE NUMBER	(2) STATE DIVISION	(3) COUNTY DIST.	(4) COUNTRY DIST.	(5) NAME	(6) LATITUDE (NORTH OR SOUTH)	(7) LONGITUDE (WEST)	(8) RELEVY DATE
4E	RIVER OR STREAM	RIVER OR STREAM	RIVER OR STREAM	ROCKY LAKE DAM	44°46' N	67°15' W	NOV 22, 1979

(9) POPULAR NAME	NAME OF IMPOUNDMENT						
ROCKY LAKE	ROCKY LAKE						

(10) REGION/STATE	(11) RIVER OR STREAM		(12) NEAREST DOWNSTREAM CITY-TOWN-VILLAGE		(13) FEDERAL FORMATION		
NEW YORK	RIVER OR STREAM		CITY-TOWN-VILLAGE		FEDERAL FORMATION		
11	ROCKY LAKE STREAM		WHITE PLAINS		1		
(14) TYPE OF DAM	(15) YEAR CONSTRUCTED	(16) PURPOSES	(17) SPILLWAY	(18) MAXIMUM DISCHARGE (CFS)	(19) VOLUME OF DAM (ACRES)	(20) NAVIGATION CAPACITIES	(21) REMARKS
CONCRETE	1961	WATER SUPPLY	SPILLWAY	14	10	4200 ft 0	N N N N N

REMARKS

(22) D.S. HAS (YES/NO)	(23) SPILLWAY HAS (YES/NO)	(24) MAXIMUM DISCHARGE (CFS)	(25) VOLUME OF DAM (ACRES)	(26) POWER CAPACITY INSTALLED (KWH/HR)	(27) POWER CAPACITY PROPOSED (KWH/HR)	(28) NAVIGATION LOCKS
NO	NO	500	400	NO	NO	NO

(29) OWNER	(30) ENGINEERING BY		(31) CONSTRUCTION		(32) REGULATORY AGENCY		(33) OPERATION		(34) MAINTENANCE	
NEW YORK STATE, GALVAN	HORN & HORN		HORN & HORN		NEW YORK STATE		NEW YORK STATE		NEW YORK STATE	

(35) DESIGN	(36) CONSTRUCTION	(37) INSPECTION BY	(38) INSPECTION DATE	(39) AUTHORITY FOR INSPECTION	
HORN & HORN	HORN & HORN	ENDO C. JORDAN CO., INC.	NOV 22, 1972	NOV 22, 1972	
(40) REMARKS					

INVENTORY OF DAMS IN THE UNITED STATES

# INVENTORY OF DAMS IN THE UNITED STATES

(1) FACILITY NUMBER	(2) CITY, COUNTY, STATE, COUNTY DIST.	(3) COUNTRY DIST.	(4) NAME	(5) LATITUDE NORTH	(6) LONGITUDE (WEST)	(7) REPORT DATE DAY MO YR
46 304	WICHITA FALLS, TEXAS	TEXAS	HICKY LAKE DAM	34°46'N	98°15'W	22 MAR 79
(8) NAME OF IMPOUNDMENT						
HICKY LAKE						
(9) POPULAR NAME						
(10) NEAREST DOWNSTREAM CITY - TOWN - VILLAGE						
WICHITA						
(11) RIVER OR STREAM						
WICHITA RIVER						
(12) TYPE OF DAM						
CONCRETE						
(13) PURPOSES						
WATER SUPPLY, HYDROPOWER, IRIGATION, NAVIGATION, FISH HABITAT, ETC.						
(14) YEAR COMPLETED						
1940						
(15) SPILLWAY HAS CHAMFERED						
NO						
(16) SPILLWAY HAS TYPED WIDTH						
50'						
(17) SPILLWAY HAS TYPED LENGTH						
150'						
(18) MAXIMUM DISCHARGE (CFS)						
4000						
(19) VOLUME OF DAM (CY)						
42000						
(20) POWER CAPACITY INSTALLED (KWH/SEC)						
6500						
(21) MANUFACTURER (NAME)						
ELECTRIC POWER & CHEMICAL CORP.						
(22) NAVIGATION LOCKS						
NO						
(23) OWNER						
U.S. BUREAU OF RECLAMATION, WICHITA DIVISION						
(24) ENGINEERING BY						
U.S. BUREAU OF RECLAMATION, WICHITA DIVISION						
(25) CONSTRUCTION BY						
U.S. BUREAU OF RECLAMATION, WICHITA DIVISION						
(26) CONSTRUCTION OPERATION						
U.S. BUREAU OF RECLAMATION, WICHITA DIVISION						
(27) MAINTENANCE						
U.S. BUREAU OF RECLAMATION, WICHITA DIVISION						
(28) INSPECTION DATE						
20 NOV 78						
(29) AUTHORITY FOR INSPECTION						
FEDERAL CIVILIAN COMMISSION						
(30) PROTECTION						
PROTECTIVE						
(31) REMARKS						
PROTECTIVE						



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02154

REPLY TO  
ATTENTION OF:  
NEDED

MAY 29 1979

Honorable Joseph E. Brennan  
Governor of the State of Maine  
State Capitol  
Augusta, Maine 04330

Dear Governor Brennan:

I am forwarding to you a copy of the Rocky Lake Dams Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Agriculture and the Department of Transportation, cooperating agencies for the State of Maine. In addition, a copy of the report has also been furnished the owner, M.J. Garber and Herman Galvin, c/o Mr. Warren Strout, MacDonald Page Co., 562 Congress Street, Portland, Maine 04112.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you, the Department of Agriculture and the Department of Transportation for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER  
Colonel, Corps of Engineers  
Division Engineer

Incl  
As stated



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REPLY TO  
ATTENTION OF:  
NEDED-E

M.J. Garber and Herman Galvin  
c/o Mr. Warren Strout  
MacDonald Page Co.  
562 Congress Street  
Portland, Maine 04112

Gentlemen:

Forwarded herewith for your information and use is a copy of the Inspection Report on the Rocky Lake Dams. This inspection was made under the authority of Public Law 92-367 by the firm of E.C. Jordan Co., Inc., Portland, Maine under the direction and supervision of the Corps of Engineers. A copy of the finished report has been forwarded to the Governor and the Department of Transportation and Department of Agriculture, the cooperating agencies for the State of Maine.

Section 7 of the report contains an evaluation and recommendations. If you have any questions concerning this report, we suggest that you contact the Department of Agriculture first. Then, if there are further questions contact the Project Management Branch, Engineering Division of this office. We thank you for your cooperation and assistance in carrying out this program.

Sincerely yours,

A handwritten signature in cursive ink that reads "Joe B. Fryar".

JOE B. FRYAR  
Chief, Engineering Division

Incl  
As Stated



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Chief, Engineering Division

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As Stated



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NEW ENGLAND DIVISION. CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02154

REPLY TO  
ATTENTION OF:  
NEDED-E

Mr. Martin C. Rissel, Engineer of  
Maintenance and Operations  
Bureau of Highways  
Department of Transportation  
State of Maine  
Transportation Building  
Augusta, Maine 04330

Dear Mr. Rissel:

Forwarded herewith for your information and use is a copy of the Inspection Report on Rocky Lake Dams. This inspection was performed in accordance with Public Law 92-367 under the direction of the Corps of Engineers. Copies of the finished report have been forwarded to the Governor, the Department of Agriculture, and the owner. We thank you for your cooperation and assistance in carrying out this program and hope this report will help you to develop an effective dam safety program.

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JOE B. FRYAR  
Chief, Engineering Division

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REPLY TO  
ATTENTION OF:  
NEDED-E

Mr. Frank Ricker  
Soil and Water Conservation Commission  
Department of Agriculture  
State of Maine  
Augusta, Maine 04330

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JOE B. FRYAR  
Chief, Engineering Division

Incl  
As stated

**END**

**FILMED**

**8-85**

**DTIC**